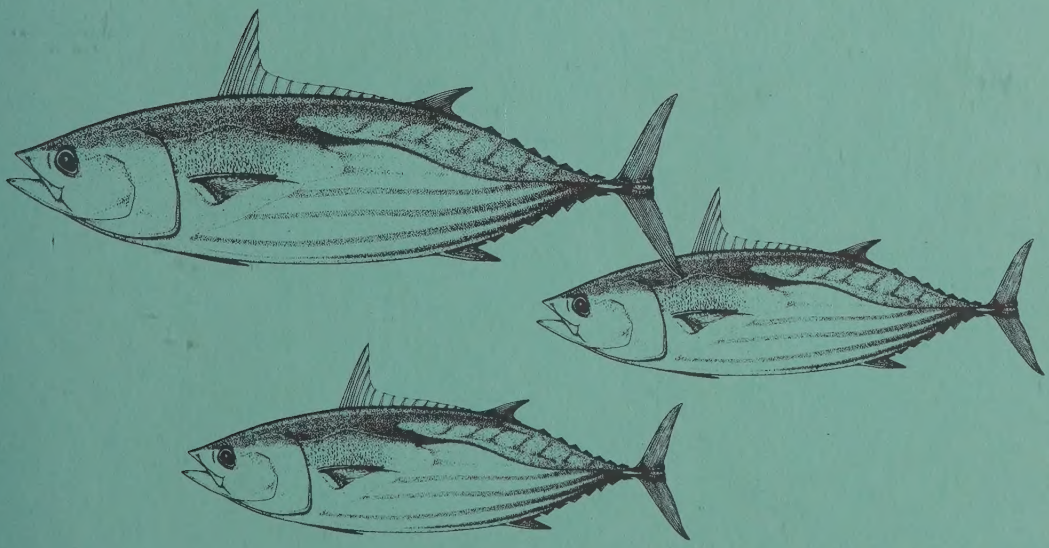
MARCH 1975
No. 3

FISHING INFORMATION

Southwest Fisheries Center-La Jolla, California



noaa NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION / NATIONAL MARINE FISHERIES SERVICE

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
SOUTHWEST FISHERIES CENTER
8604 LA JOLLA SHORES DRIVE - P. O. BOX 271
LA JOLLA, CALIFORNIA 92037

FISHING INFORMATION

MARCH 1975, No. 3

EDITOR: JAMES A. RENNER

B. J. Rothschild, Director, SOUTHWEST FISHERIES CENTER
I. Barrett, Deputy Director
R. Shomura, Director, Honolulu Laboratory

PREFACE

This publication, Fishing Information, appears monthly and contains 1) fishery advisory information, 2) a narrative description of pertinent surface temperature conditions, 3) a narrative description of subsurface temperature structure for parts of the North Pacific, 4) charts of winds and pressures for the eastern North Pacific, 5) charts of sea surface temperature for the North Pacific and eastern tropical Pacific, and 6) charts of subsurface temperature structure in the eastern North Pacific.

A supplement to Fishing Information appears at 15-day intervals throughout the year. This is a chart of sea surface temperature (contoured at 2°F (1°C) intervals) from Baja California to Vancouver Island out to about 135°W. Special bulletins are published in conjunction with the 15-day sea surface temperature charts which include short-term projections of albacore distribution and locations of productive fishing areas, information on oceanographic and atmospheric conditions, and other information as is appropriate during the albacore fishing season.

The Secretary of Commerce has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this Department. Use of funds for printing this publication approved by the Office of Management and Budget, August 20, 1973; this approval expires June 1976.

Submitted for publication - April 22, 1975

CONTENTS

PAGE

Acknowledgements iv

Sea Surface Temperature and Environmental Conditions - March 1975, L. Eber and F. Miller 1

Subsurface Temperature Structure in the Northeast Pacific Ocean, J.F.T. Saur 2

ENVIRONMENTAL CHARTS, PACIFIC OCEAN - March 1975

Figure 1. Fifteen-year mean (1961-1975) observed sea level values of barometric pressure (millibars), resultant wind direction (degrees true), resultant wind speed (knots) and average wind speed (knots) regardless of direction 4

Figure 2. Observed sea level values of barometric pressure (millibars), resultant wind direction (degrees true), resultant wind speed (knots) and average wind speed (knots) regardless of direction 5

Figure 3. Mean sea surface temperature, eastern North Pacific Ocean. Squares show temperatures at weathership stations. Numerals on shore are temperatures at coastal and lightship stations 6

Figure 4. Mean sea surface temperature chart, western North Pacific Ocean 7

Figure 5. Deviation of sea surface temperatures, eastern North Pacific Ocean from 20-year mean (1948-67). Hatched areas are colder in 1975 8

Figure 6. Deviation of sea surface temperatures, western North Pacific Ocean from 20-year mean (1948-67). Hatched areas are colder in 1975 9

Figure 7. Deviation of sea surface temperatures, eastern North Pacific Ocean from those of March 1974. Hatched areas are colder in 1975 10

Figure 8. Mean sea surface temperatures, eastern tropical Pacific Ocean. Numerals on shore are temperatures at coastal stations 11

Figure 9. Deviation of sea surface temperatures, eastern tropical Pacific Ocean from 20-year mean (1948-67). Shaded areas are colder in 1975. Contours are dashed in sparse data areas 12

Figure 10. Surface temperature and salinity and subsurface temperature structure from expendable bathythermograph observations between Honolulu and Seattle March 12-17, 1975..... 13

Figure 11. Surface temperature and salinity and subsurface temperature structure from expendable bathythermograph observations between Honolulu and San Francisco: 14

ENVIRONMENTAL CHARTS ANALYZED BY:

F. Miller (Figures 8 and 9)
J. Renner (Figures 1,2,3,4,5,6,7,10,11 and 15-day Supplement)

TECHNICAL EDITOR:
K. Raymond
CARTOGRAPHY:
R. Allen

Acknowledgements

The following organizations and stations contributed data for March 1975 charts:

Hopkins Marine Stations, Pacific Grove, California, J.P. Balesteri
Kelco Company, San Diego, California
Living Marine Resources, Inc., San Diego, California
National Oceanic and Atmospheric Administration
National Marine Fisheries Service, La Jolla, California: Honolulu, Hawaii
National Weather Service, San Diego, California and Washington, D.C.
National Ocean Survey, Pacific Marine Center, Seattle, Washington
Pacific Environmental Institute, Fisheries Research Board of Canada, West Vancouver, British Columbia, by L.F. Giovando from observations by
T. Carr at Langara Island Light; D.L. Kupillas at Cape St. James Light; L. Collins at Kains Island Lightstation; I.G. McNeil at Amphitrite Point Light.
Scripps Institution of Oceanography, La Jolla, California.
Fishing Vessels, Aquarius, Captain Joe Medina, Conquest, Frances Ann, Jeanette C., Kathleen, Lucky Strike, Marco Polo, Maria C.J., Marietta, Mary Barbara, Pan Pacific, Polaris, Queen Mary, Raefello, Santa Rosa, Sea Treasure, Venturous, Willa G.

Expendable bathythermograph and salinity observations are made by the mates and engineers of the Californian and Hawaiian Queen of Matson Navigation Co. The data are processed under supervision of D.R. McLain at the NMFS Pacific Environmental Group, Monterey, using computer facilities of the Fleet Numerical Weather Center. The project is partially supported by the National Science Foundation and the Office of Naval Research under Government NAonr-9-74.

Sea Surface Temperature and Environmental Conditions

L. EBER AND F. MILLER

Eastern North Pacific

Sea surface temperatures continued to cool slightly in central portions of the eastern North Pacific between February and March 1975, as seasonal minimums were approached. Some warming was observed in areas along the North American West Coast and northeast of Hawaii in the vicinity of 35°N. As a result, areas of positive deviations from normal continued to shrink west of 135°W while negative departures tended to diminish, or become positive, east of 135°W (Figure 5). The overall pattern remained weak, however, with deviations less than 2°F (1.1°C).

Barometric pressures were higher than normal by more than 4 millibars in the central part of the eastern North Pacific from 35° to 45°N, between longitudes 145° and 165°W. Pressures were below normal over areas south of the Aleutian Islands and along the U.S. west coast (Figures 1 and 2). The resultant winds associated with this pressure pattern had greater-than-normal southward components east of 140°W and northeastward components from 150° to 170°W, between latitudes 45° and 55°N. No simple relationship of wind and pressure fields with sea surface temperature changes was apparent.

Western North Pacific

The onset of early spring warming was evident in some portions of the western North Pacific, primarily to the east of 165°E, with an increase of positive temperature deviations from normal in March 1975 as compared with the previous month. Surface waters west of 165°E and north of 25°N continued to cool slightly. Relatively cold temperatures persisted off Hokkaido and in the region from 25° to 30°N, between 145° and 160°E, where negative deviations of 2°F (1.1°C) occurred. Above-normal temperatures have persisted, since January along the islands southwest of Kyushu to Taiwan and also in an area east of Honshu, 150° to 155°E between 35° and 40°N.

Eastern Tropical Pacific

The normal seasonal increase or decrease in sea surface temperature from February to March is less than 2°F (1.1°C) over most of the eastern tropical Pacific. However, between the equator and 10°S from 85°W t 110°W seasonal warming of 2°F (1.1°C) and greater is expected. Another area with a similar normal warming trend from February to March occurs between 93°W and 100°W and stretches southward in a fan-shaped pattern from the Gulf of Tehuantepec to 5°N. Off the west coast of southern Baja California, surface temperatures usually cool 1°-2°F (0.6°-1.1°C) from the previous month. The equatorial front, represented by a strong north-south temperature gradient along the equator, usually remains as weak in March as it does in February.

In March 1975 the equatorial front between the coast of Ecuador and 100°W was non-existent at the surface (Figure 8). Surface temperatures in this area were more than 2°F (1.1°C) above normal (Figure 9). Sea surface temperatures have not been over 82°F along the equator east of 95°W since January 1973 when the 1972-73 El Niño was coming to an end. A positive anomaly of 2°F (1.1°C) was found around the Gulf of Guayaquil also in March. Fishermen reported temperatures of 81°-82°F in this area. Temperatures farther south along the coast of Peru, based on a few ship reports, appeared to be slightly below normal, especially within 50-100 miles of the coast.

In the northern hemisphere temperatures remained more than 2°F (1.1°C) below normal (Figure 9) in the tuna fishing grounds to the west and south of Baja California. This condition has persisted for the past year. To the east of 100°W from 7°N to 10°N temperatures were slightly colder than normal over the fishing grounds. This was a result of persistent strong northeast trades in March which caused considerable ocean mixing in the surface layers south and westward from Nicaragua. Over the tropical fishing grounds west of 100°W from the equator to 10°N surface temperatures have been warming up and are above normal over most of that region.

Subsurface Temperature Structure in the Northeast Pacific Ocean

J.F.T. SAUR*

Subsurface temperature sections are presented in this issue for two routes between U.S. west coast ports and Hawaii: Seattle to Honolulu, Figure 10 and Honolulu to San Francisco, Figure 11. The observations for both sections were taken near mid-March.

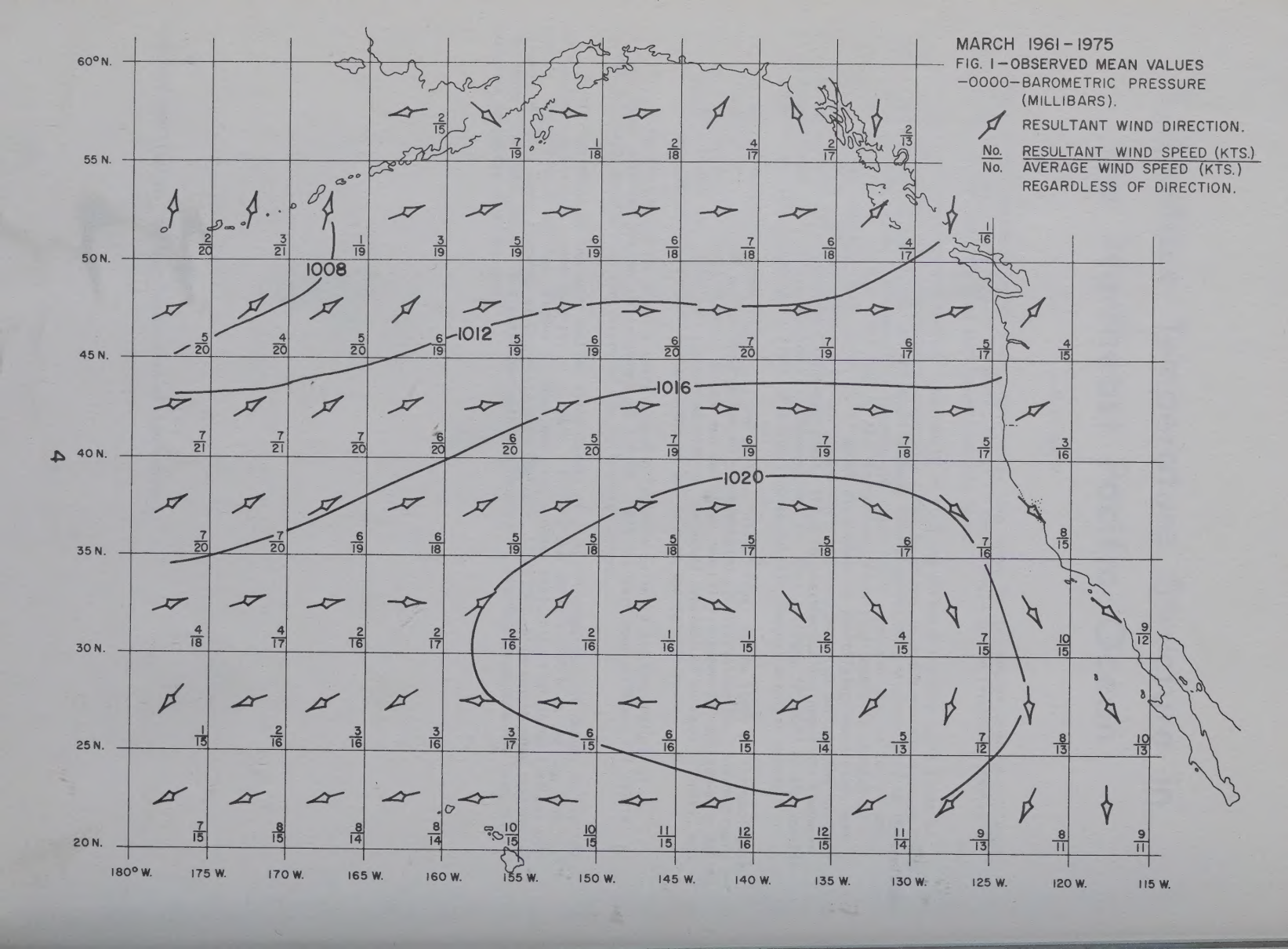
Over most of the Northeast Pacific Ocean north of 25°N the seasonal cooling cycle (loss of heat from ocean surface to the atmosphere) generally comes to an end in March and the surface mixed layers reach their maximum depth. On the Seattle route from Observation 2 southwestward to Observation 21 the depths of the layers were generally between 100 m and 120 m. Between observation 21 and Hawaii the depth of the surface layer (top of the thermocline) undulated generally between 80 m and 140 m. Surface salinity data, which are of great assistance in identifying boundaries, were not available for the Seattle route. A surface temperature boundary occurred just to the southwest of Observation 21 and the subsurface isotherms around 150 m in the thermocline began the downward trend toward Hawaii just to the northeast of Observation 21. Thus latitude 32°-33°N on the Seattle route appeared to mark the northern limit of Eastern North Pacific Central Water in winter.

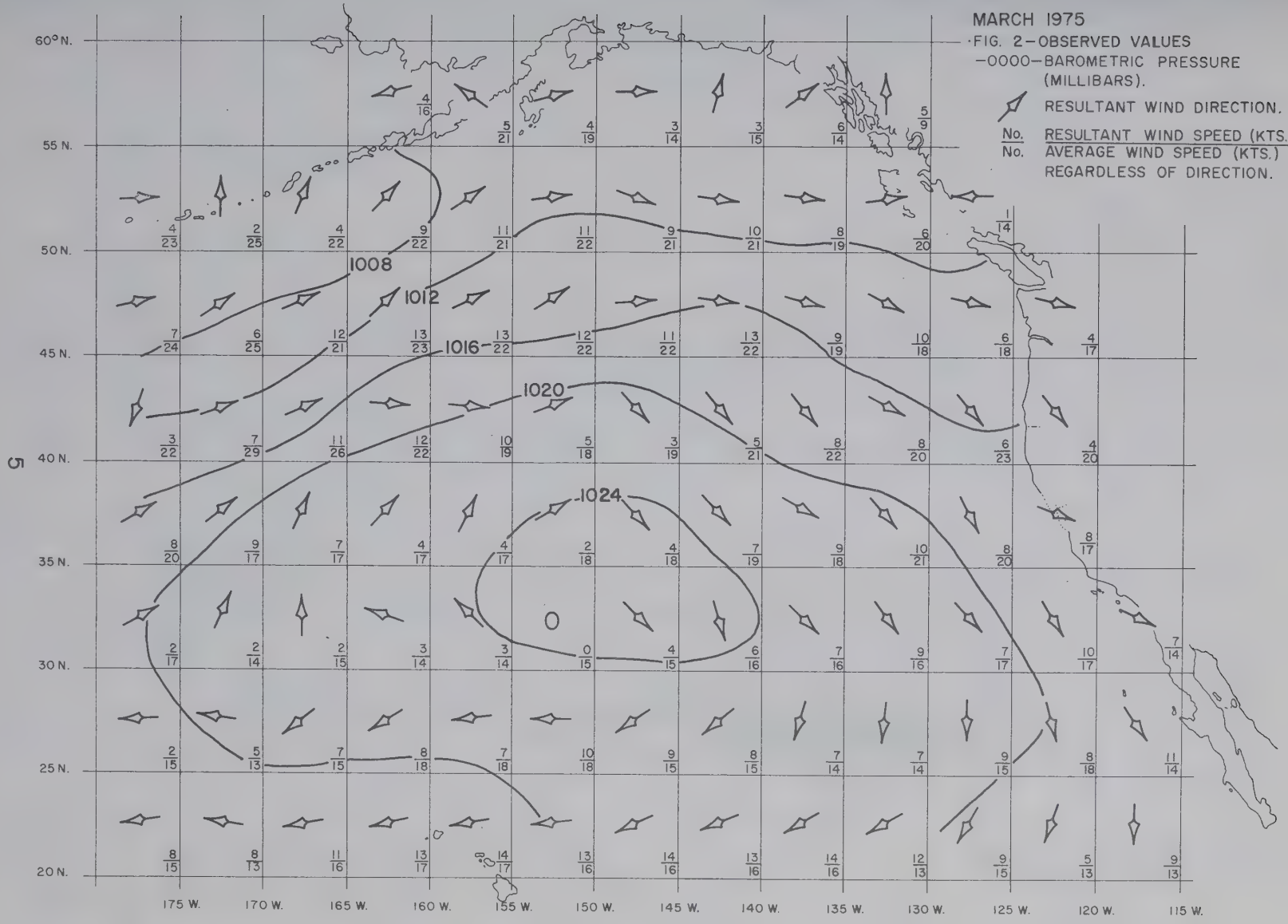
On the San Francisco route, Figure 11, the surface "mixed" layer depths (tops of thermoclines) were generally less than 100 m from Observation 65 southwestward to Observation 56. Southwestward of there the depths were significantly deeper and undulated generally between 130 and 160 m in depth. This change occurred near 33°N, was associated with an increased gradient of surface salinity, and marked a boundary probably related to that found at 32°-33°N on the Seattle route.

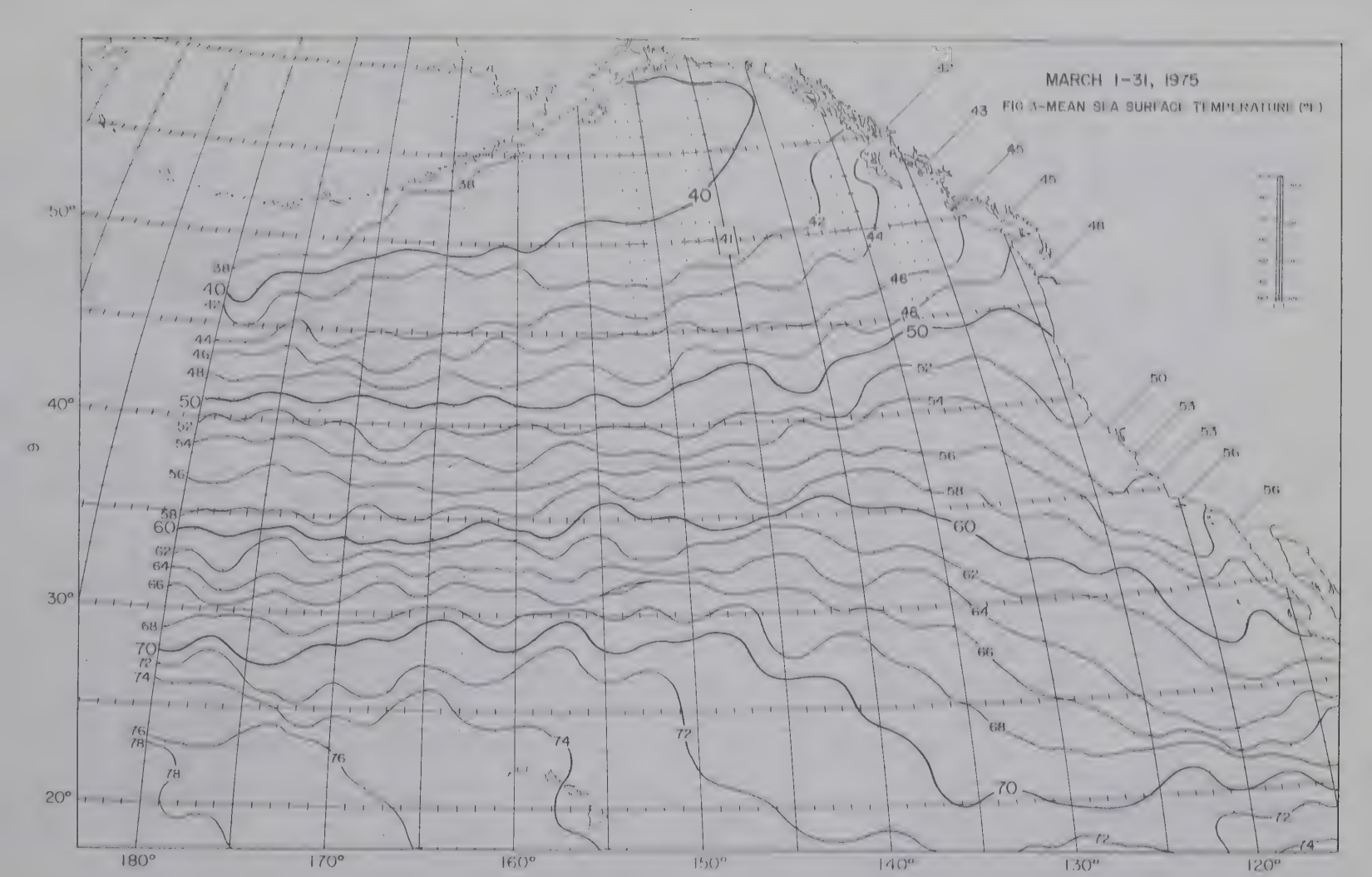
Closer to the California coast a sharp change of surface salinity and temperature of the surface layer occurred between Observations 59 and 60. This boundary near 35°N and 131°-132°W marked the outer boundary of the waters of the California Current.

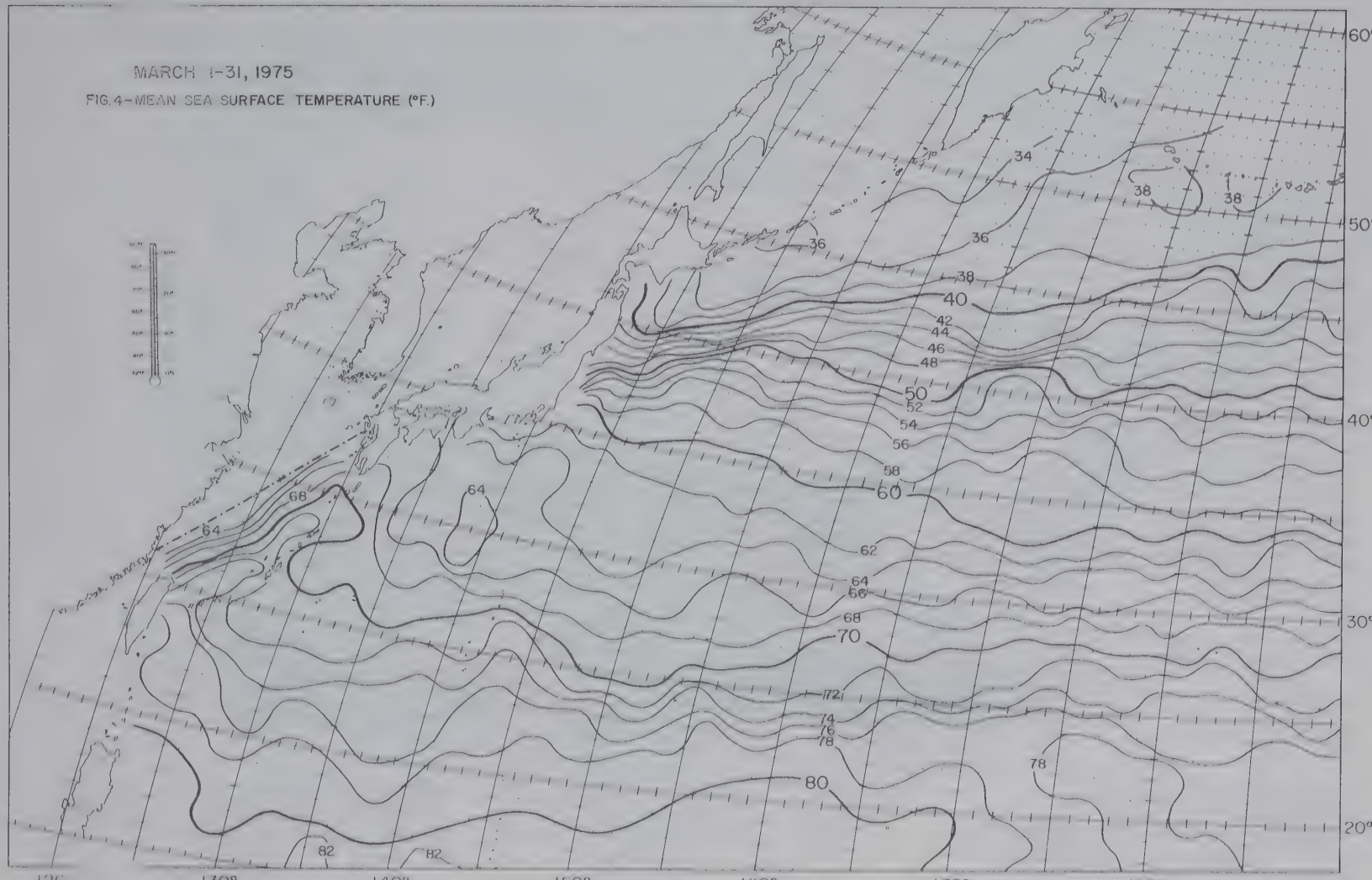
At the beginning of February shallow mixed layers of 75 m, in comparison to depths of 120-130 m at neighboring stations, were observed at 28°26'N, 145°30'W and 26°30'N, 149°W on the San Francisco route. The mid-March section, Figure 11, does not give a clear indication that these features persisted. A 130 m layer occurred at Observation 46 (28°46'N, 145°23'W) while neighboring stations had layers 150-160 m deep. This coincides with one location in February, but does not have the contrast in depths observed then.

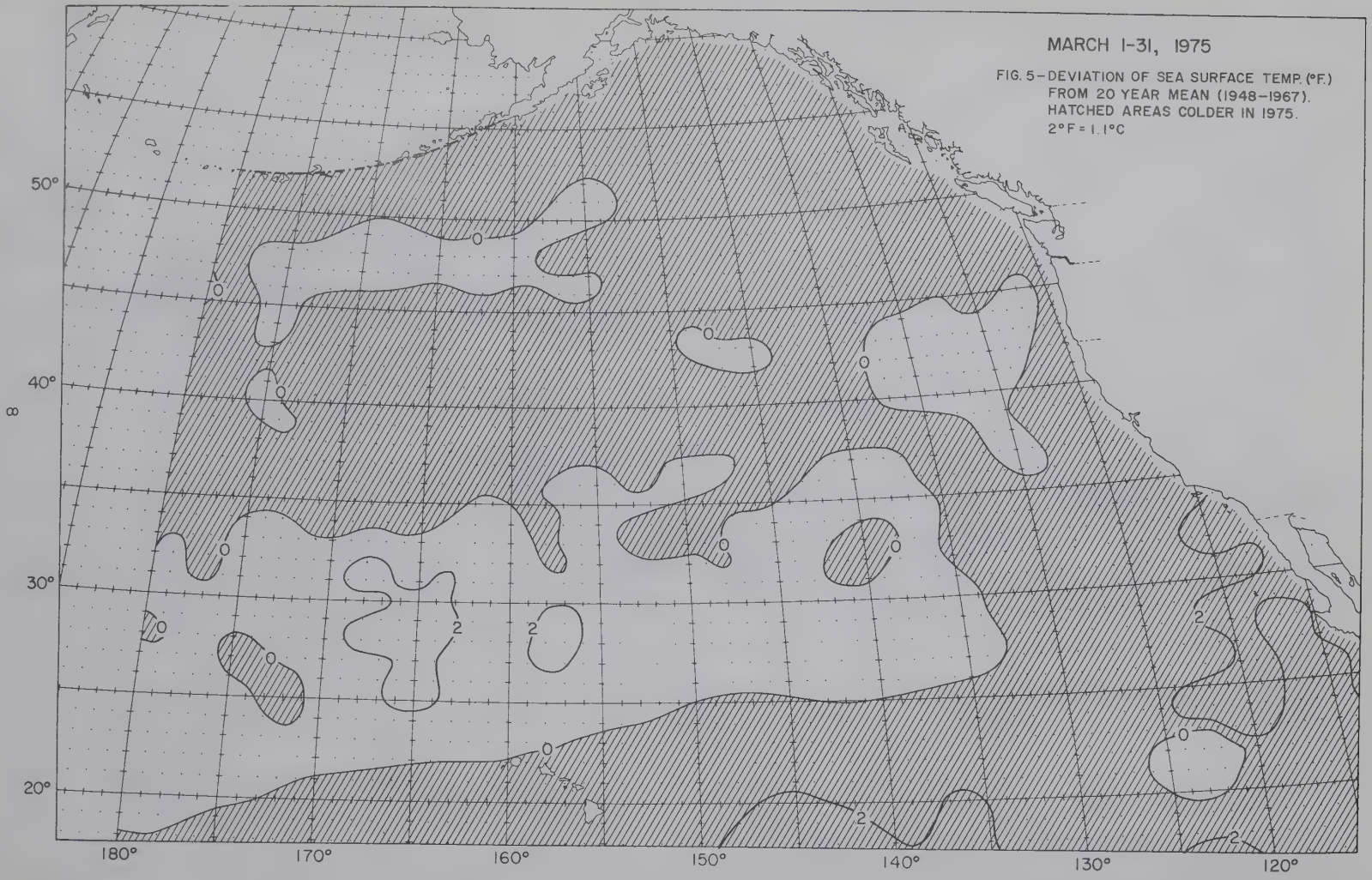
*Present affiliation: Scripps Institution of Oceanography

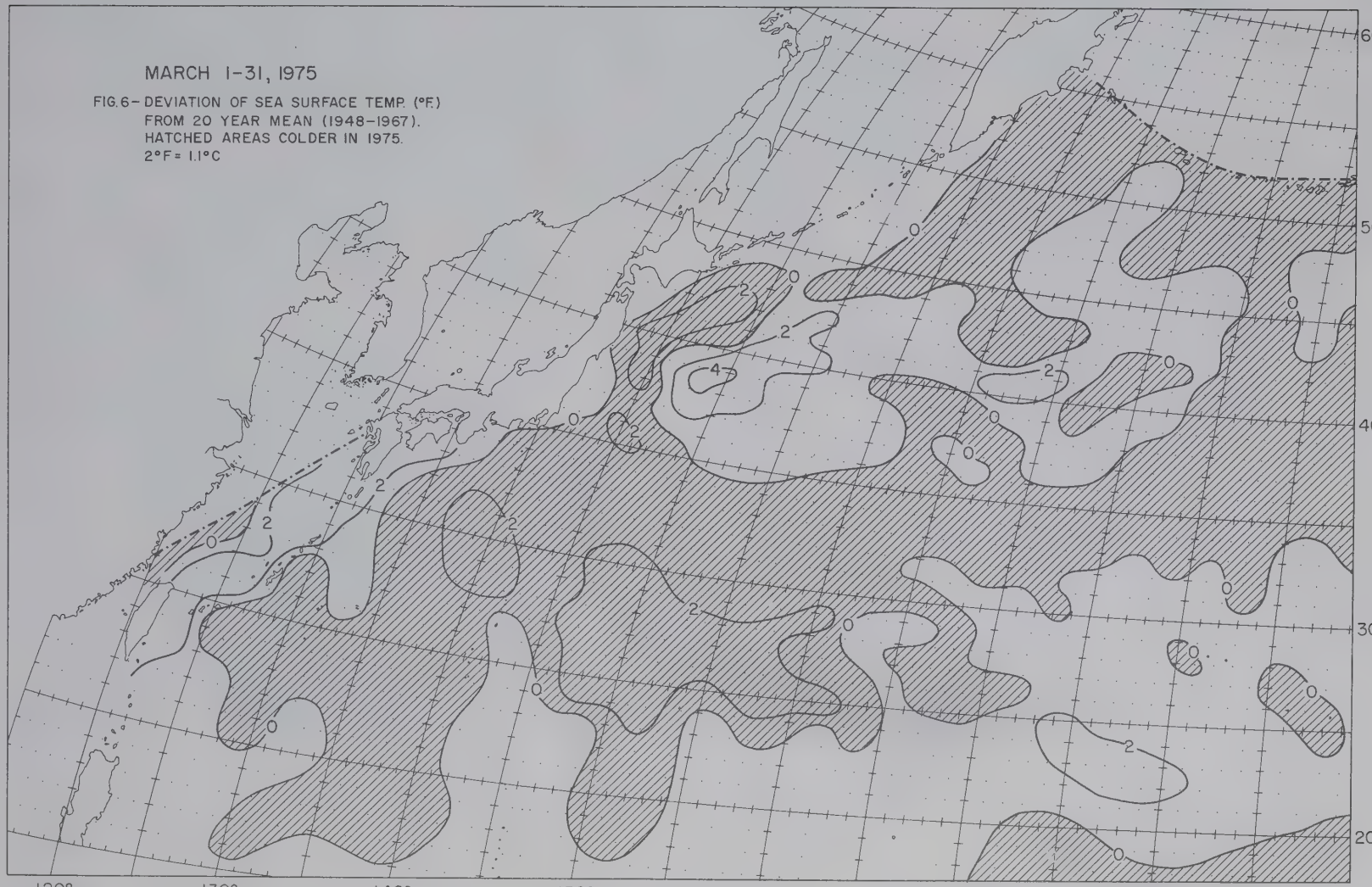

MARCH 1961 - 1975
FIG. 1 - OBSERVED MEAN VALUES
-0000- BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.)
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1008
1012
1016
1020
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.

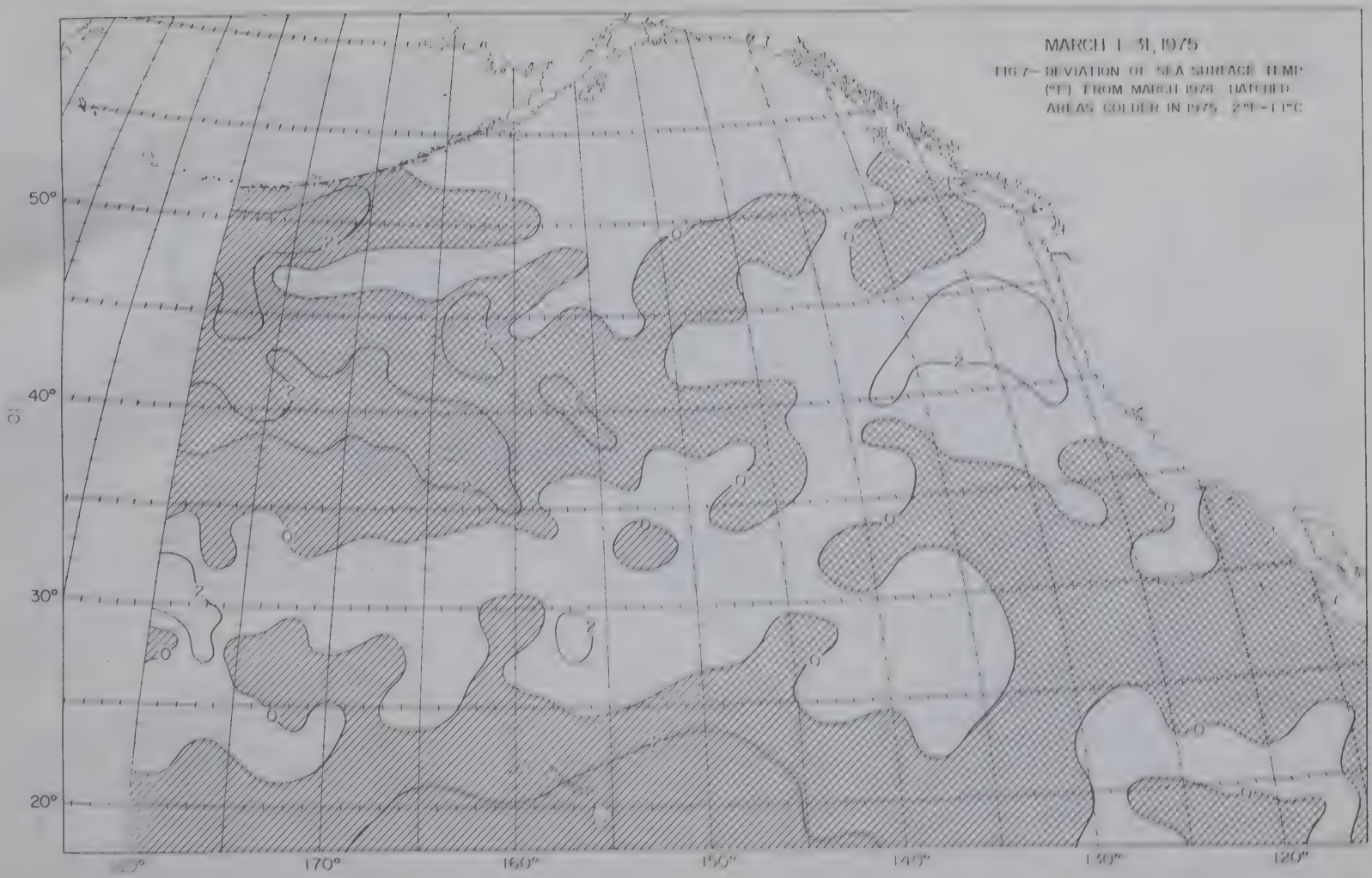

MARCH 1975
·FIG. 2-OBSERVED VALUES
-0000-BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.)
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1008
1012
1016
1020
1024
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.

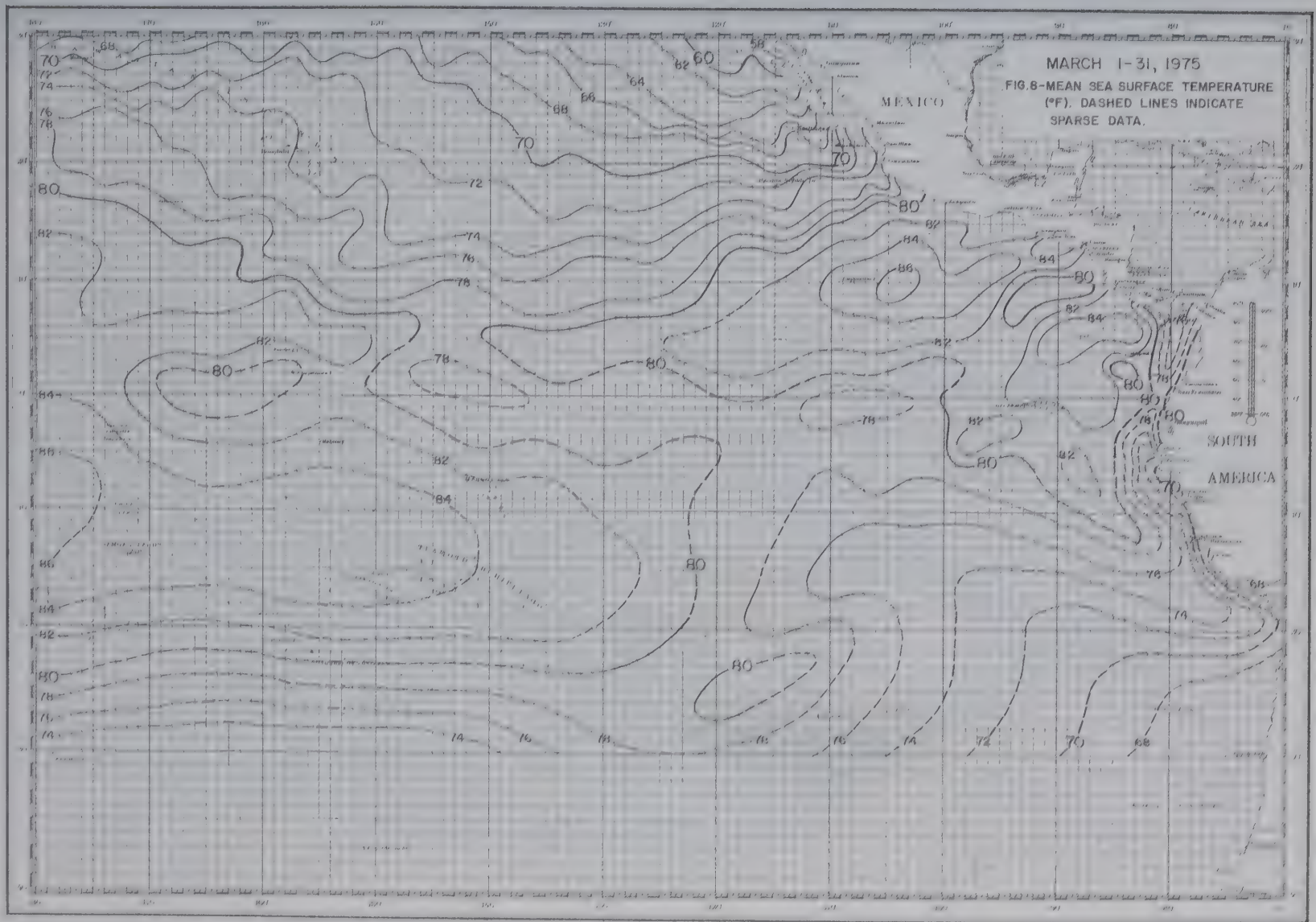

MARCH 1-31, 1975
FIG 3-MEAN SEA SURFACE TEMPERATURE (°F)
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°


MARCH 1-31, 1975
FIG. 4-MEAN SEA SURFACE TEMPERATURE (°F.)
60°
50°
40°
30°
20°
120
130°
140°
150°
160°
170°
180°
34
36
38
40
42
44
46
48
50
52
54
56
58
60
62
64
66
68
70
72
74
76
78
80
82


MARCH 1-31, 1975
FIG. 5 – DEVIATION OF SEA SURFACE TEMP. (°F.) FROM 20 YEAR MEAN (1948–1967). HATCHED AREAS COLDER IN 1975.
2°F = 1.1°C
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°
0
2


MARCH 1-31, 1975
FIG. 6 - DEVIATION OF SEA SURFACE TEMP. (°F.)
FROM 20 YEAR MEAN (1948-1967).
HATCHED AREAS COLDER IN 1975.
2°F = 1.1°C
60°
50°
40°
30°
20°
120°
130°
140°
150°
160°
170°
180°


MARCH 1-31, 1975
FIG 7 – DEVIATION OF SEA SURFACE TEMP (°F) FROM MARCH 1974 HATCHED AREAS COLDER IN 1975 2°F = 1°C
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°


MARCH 1-31, 1975
FIG.8-MEAN SEA SURFACE TEMPERATURE (°F). DASHED LINES INDICATE SPARSE DATA.
MEXICO
SOUTH AMERICA

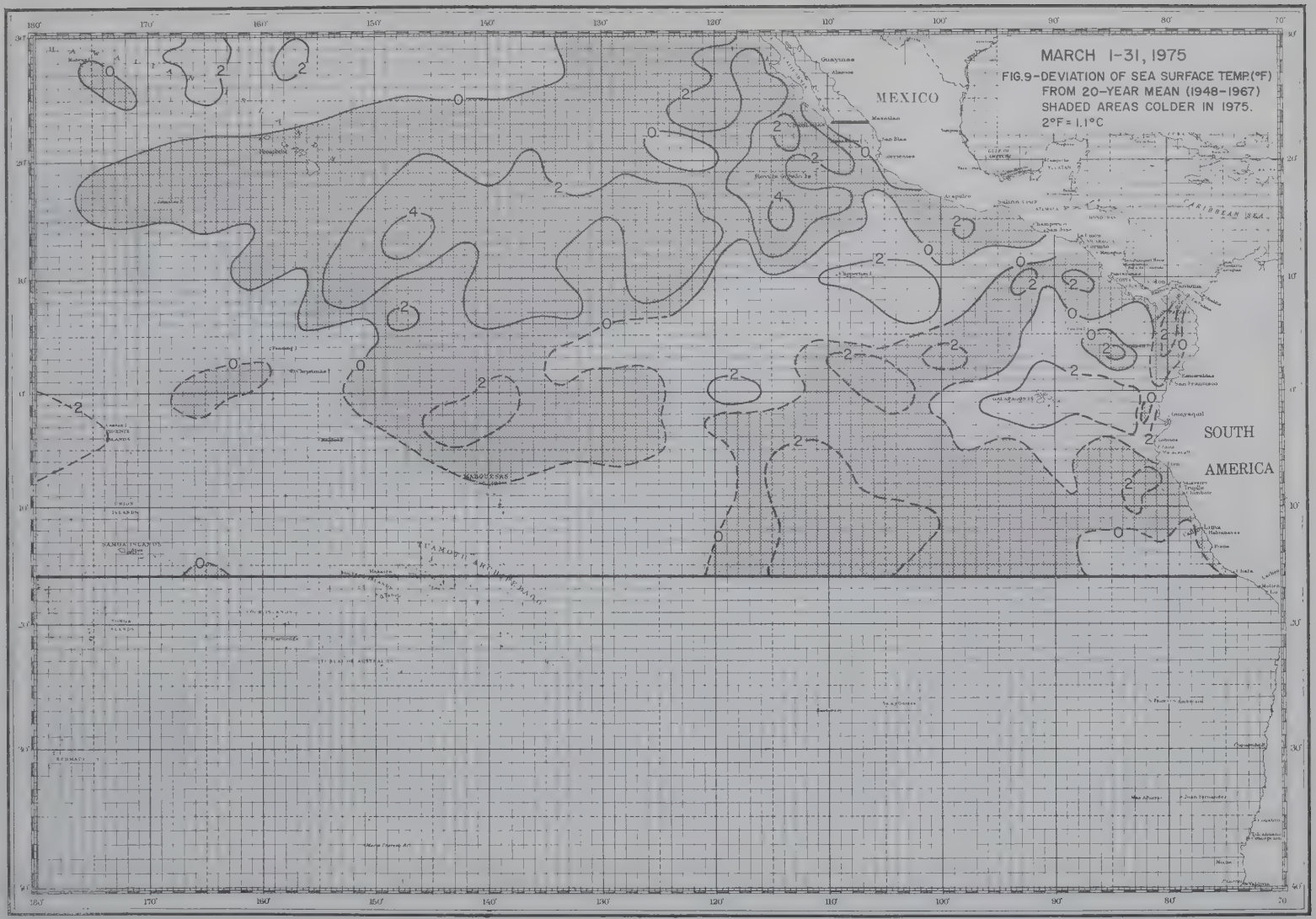
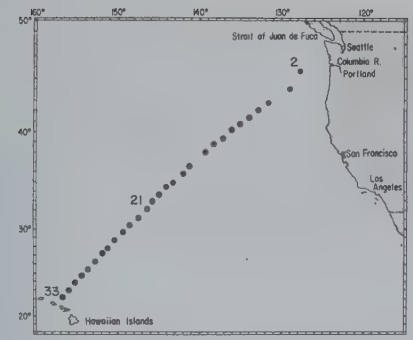
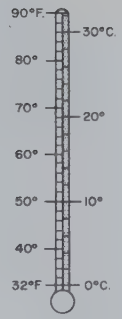

MARCH 1-31, 1975
FIG.9-DEVIATION OF SEA SURFACE TEMP.(°F)
FROM 20-YEAR MEAN (1948-1967)
SHADED AREAS COLDER IN 1975.
2°F = 1.1°C
MEXICO
SOUTH
AMERICA
CARIBBEAN SEA
180°
170°
160°
150°
140°
130°
120°
110°
100°
90°
80°
70°

FIGURE 10





HONOLULU — SEATTLE
(Makapuu Pt. — St. of Juan de Fuca)

MARCH 12-17, 1975

CALIFORNIAN

VOYAGE 254

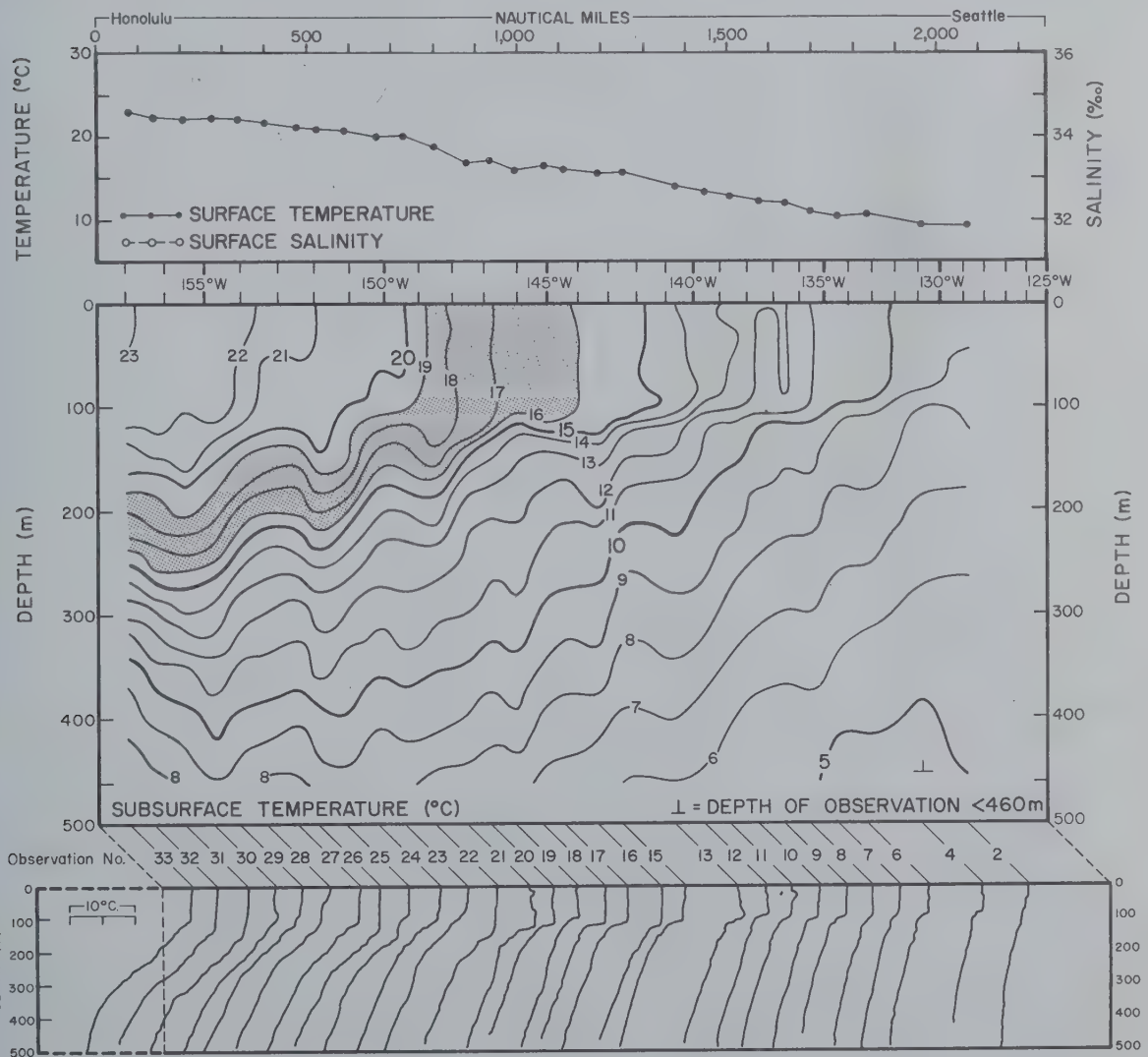
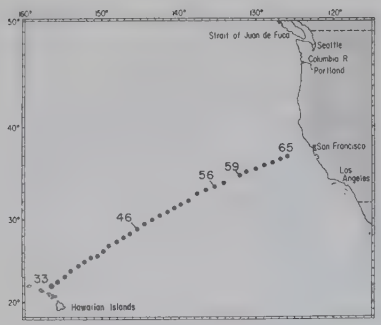
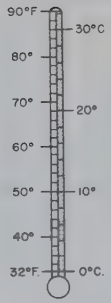


FIGURE 11



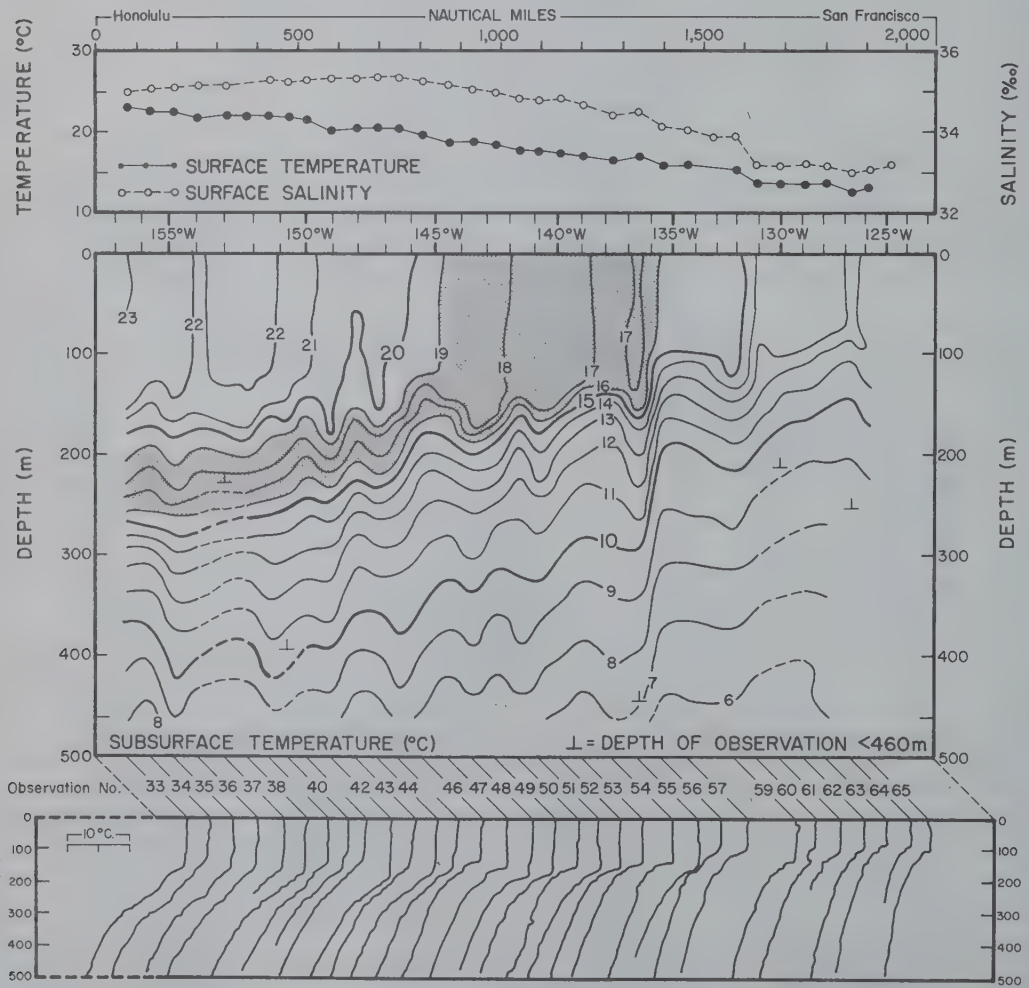


HONOLULU – SAN FRANCISCO

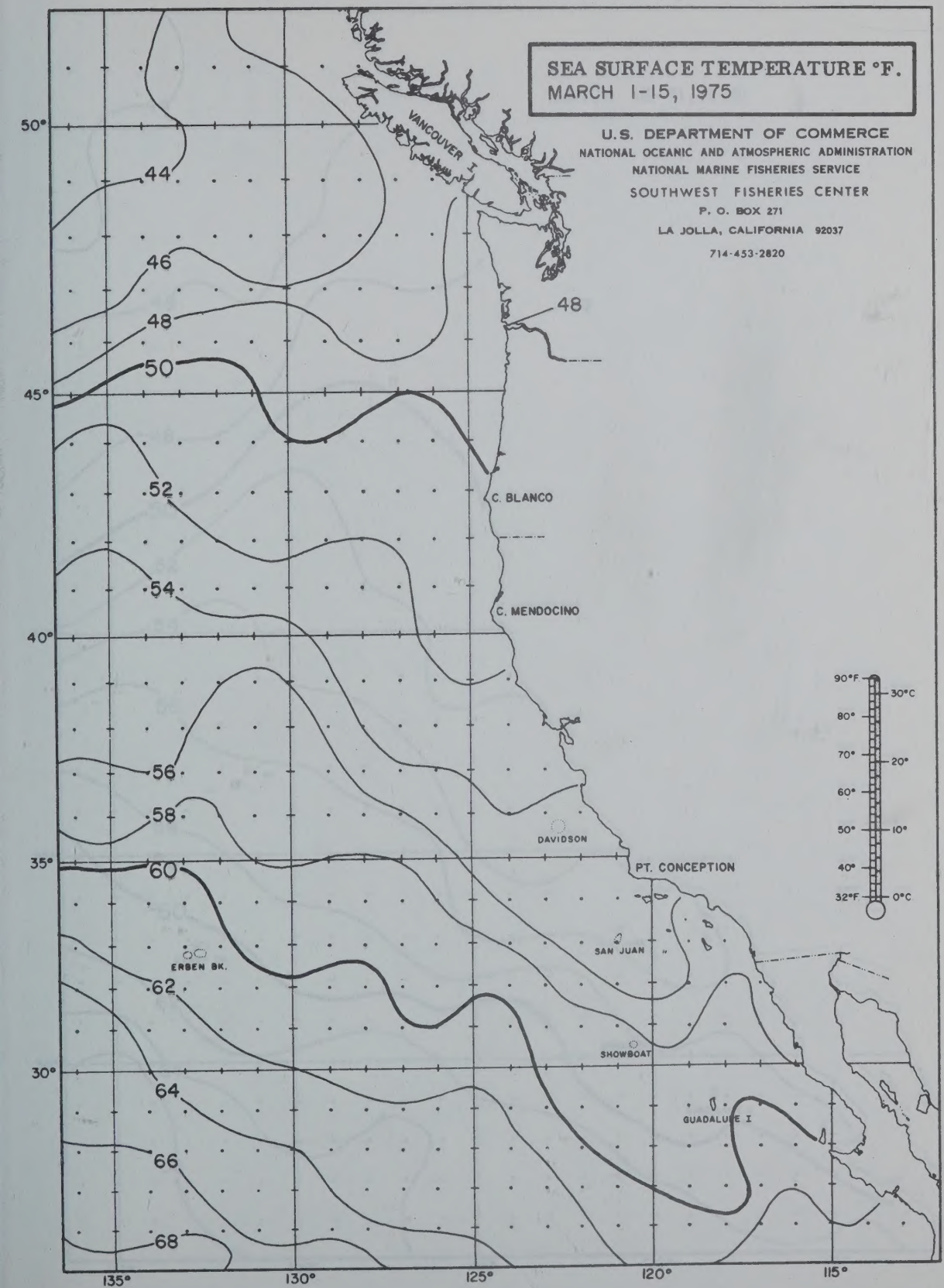
MARCH 17-22, 1975

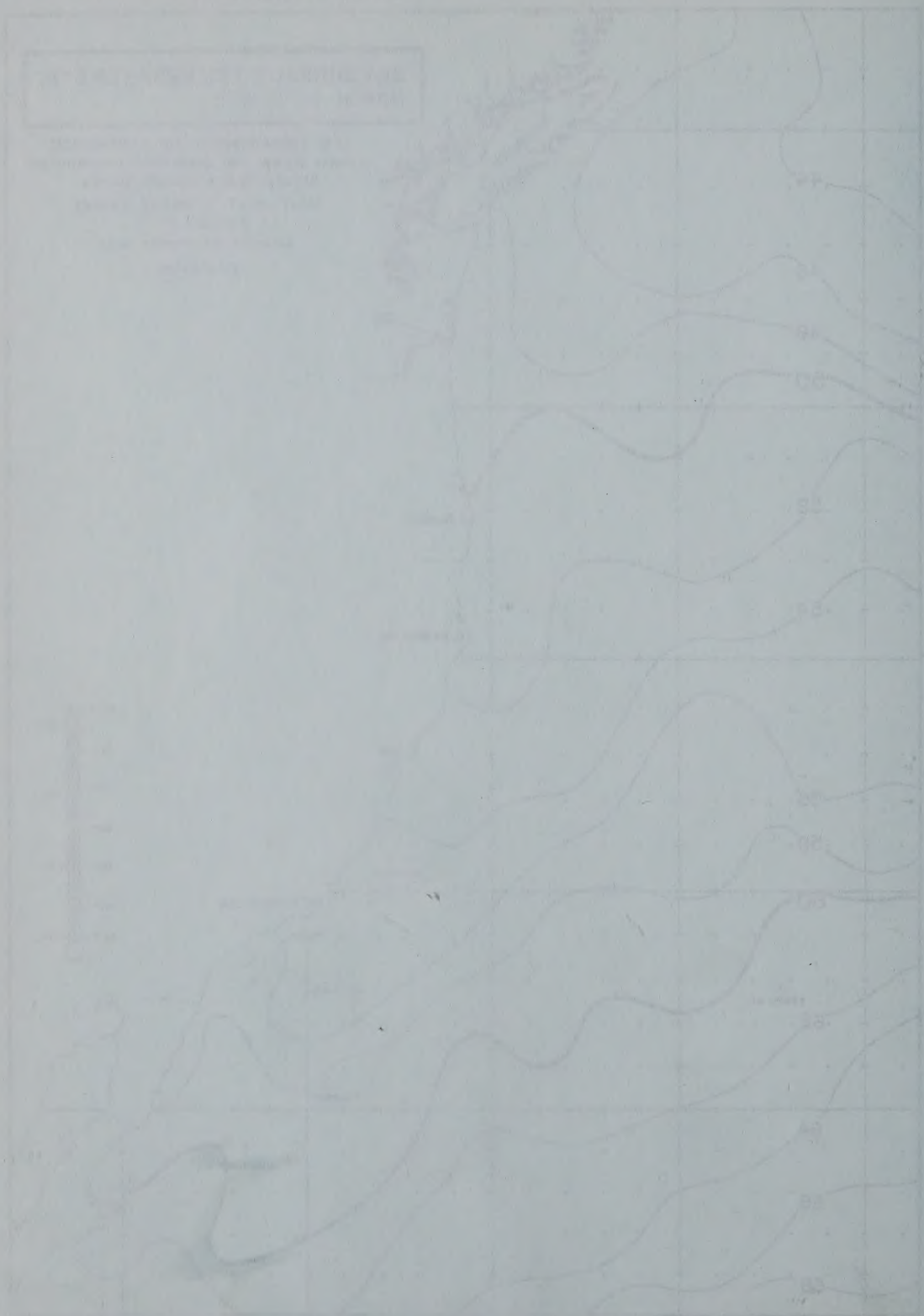
HAWAIIAN QUEEN

VOYAGE 154



FISHING INFORMATION – supplement





FISHING INFORMATION – supplement